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Effects of Online Repetition Practice with Animated Visual Aid on the Acquisition of Japanese Pitch Accent and Special Moras

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Abstract

Errors in pitch accent and special moras in Japanese can lead to miscommunication, and it is important to practice producing these at an early stage of the language learning process. However, pronunciation practice is often dismissed in the classroom due to time constraints and lack of systematic materials (Taniguchi, 1991; Macdonald, 2002, Shibata, 2015). From these reasons, an online pronunciation practice material was developed. This preliminary study examined the effectiveness of the online repetition practice and then investigated the effectiveness of the animated visual aid. The study applied a pre post test research design and recruited 6 participants from a first-year Japanese language course. They were randomly divided into three practice groups and a control group; 1) video + visual aid practice group, 2) visual aid only practice group, 3) video only practice group, and 4) control group. The visual aid in this research modeled a “karaoke” system, where each mora in the word appears at the same time as when that mora is pronounced, and also indicates the high and low

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pitch accent for each mora. The whole process was completed within 30-minutes. The descriptive analysis result showed that online repetition practice using the “karaoke” model visual aid has a positive effect on short-term pitch accent production, but not on the accurate production of special moras. Future studies are needed to investigate whether long-term online repetition practice using this visual aid could lead to learners’ accurate special moras production and the retention of acquired pitch accent.

INTRODUCTION

Purpose of this Study

In the field of Second Language Acquisition (SLA), pronunciation is referred to as the “Cinderella” area of foreign language teaching because it is often times neglected, just like how Cinderella’s step mother and sisters did not allow Cinderella to be shown in public (Kelly, 1969). Scholars have studied vocabulary and grammar for a much longer time compared to pronunciation, and this is said to be the same in Japanese as a second/foreign language education. However, scholars are not the only ones who are neglecting pronunciation; teachers also do not spend nearly as much time on pronunciation as they spend on teaching vocabulary and grammar.

The Communicative Approach is commonly used in foreign language classrooms today, but despite emphasis on speaking skills development, pronunciation practice is usually not incorporated into the curriculum due to a lack of time and materials (Taniguchi, 1991; Hannahs, 2007; Sturm 2013a; b; Shibata, 2015;). In

contrast, previous studies have found that learners desire to improve their pronunciation and want to sound native-like (Harlow and Muyskens 1994; Derwing and Munro, 2009). Therefore, there appears to be a gap between classroom instruction and learners' desire for pronunciation practice.

The goal of this paper is to rethink the needs of pronunciation instruction, and how the current instruction could be changed in a positive way so that the skills that learners acquire in and outside of class will benefit their communicative ability in real life situations.

LITERATURE REVIEW

In order to fill in the gaps between the teachers' and students' beliefs, it is important to think about ways to incorporate pronunciation training into the curriculum. Previous studies have shown that formal instruction on pronunciation is indeed beneficial for learners to improve their pronunciation skills. For example, Elliott's study in 1997 showed that adult learners of Spanish benefit from phonological instruction when they complete exercises that focus on the target language sound system, especially for the word reading, the sentence repetition, and the word repetition exercise. This finding suggests that teaching pronunciation is beneficial, and should be incorporated more in the communicative classroom. Also, Lord (2005) had done a study on the effects of explicit instruction given in a Spanish phonetics class. The treatment that was given to the experimental group (the group enrolled in the Spanish phonetics class) consisted standard phonetics instruction,

practice with voice analysis software, and oral self-analysis projects, and these explicit instructions helped participants' Voice Onset Time (VOT) and level of accuracy to become closer to that of a native speaker's.

Ideally, it would be best if phonetic classes could be offered in addition to regular language classes as in Lord's (2005) study, but that is not always possible. Then, the next possible solution would be using class time for phonetic instruction such as in Elliott's (1997) study, but previous survey studies mentioned that teachers say that they do not have time to teach pronunciation in class, because they have so many other things to cover. Then, a possible remedy to this situation is to incorporate pronunciation training when teaching other components such as vocabulary.

Previous findings have shown that when vocabulary is categorized into certain groups, it facilitates the memorization process. This categorization can take various forms, including organization according to meaning, orthographic sequences, and sound structures. For instance, Nicolaidis and Mattheoudakis (2012) focused on categorizing words into their similar sound structures. When introducing new vocabulary to beginning and elementary level ESL learners, they suggested grouping the nouns with the same English vowel sounds, and color coding the vowel sounds. The authors stated that retention of vocabulary is enhanced when there is more information to process, therefore, it is beneficial to combine vocabulary and pronunciation practice as it requires learners to process the new words both semantically and phonologically, which intensifies the processing load.

Another possible solution for not having enough time to teach pronunciation in class is to take advantage of the various online platforms that are available today in language teaching. Jia and Ding's study (2012) aimed to compare the difference in effectiveness of acquiring vocabulary when using a Computer Assisted Language Learning (CALL) system which can give immediate feedback and provides more customized quizzes with a traditional classroom where they don't use any CALL system. The result showed that this system 1) improved the students' test performance, especially the vocabulary acquisition. Although this study did not focus on pronunciation, these results could also be reflected in pronunciation practice, and that providing pronunciation practice assignments online may be beneficial not only for teachers (where they would not have to use class time and for those who do not know how to teach pronunciation) but for the learners as well.

Nicolaidis and Mattheoudakis (2012) emphasized the importance in vocalizing the words when learning new vocabulary because speech production involves the movement of muscles, joints, and coordination of articulatory gestures. They state that through production practice, the articulatory movement becomes automatic and leads to fluent speech. Although repetition and drill practices are not favored in the communicative approach since it can be completed without understanding the meaning (Wong and VanPatten, 2003), other scholars claim that repetition practice is actually beneficial in improving learners' pronunciation skills (Kawai & Hirose, 2000; Yoshida & Fukada, 2014).

In addition to repetition practice, the use of visual aids has been found to be important in pronunciation practice. In Kubozono's study (2002), it was found that learners of Japanese depend more on non-temporal cues and that visual information can stimulate the correct perception on certain phonological awareness (especially on phonological items that are not present in the learners' first language). The visual aid that was found to be effective in Kubozono's study was lip movement, but there are studies that used visual aids other than lip movement to see its effectiveness when teaching Japanese pronunciation.

Japanese Phonology: Pitch Accents and Special Moras

There are two important characteristics of Japanese pronunciation where its errors can change the meaning of words, which are pitch accent and special moras (special moras include long vowel, double consonant, and the moraic nasal).

Pitch accent. In Japanese pitch accent, there is either a high or a low pitch, and learners have to be able to first detect the falling pitch point, and to memorize the pitch pattern for 1) disambiguation, and 2) comprehension of words and phrases (Tsujimura, 2013). The first role, disambiguation means that pitch accent helps determine the meaning of a word. In Japanese, there are a large number of word pairs that are distinguished only by pitch accent. For example, the word *Ame* has two meanings depending on the pitch accent: *Ame* with a High-Low pitch means 'rain' and *Ame* with a Low-High pitch means 'candy'.

A sentence that can be used to understand the second role, comprehension of

words, is ‘*Niwa niwa niwa niwatori ga iru.*’ This sentence is difficult to understand without any pitch accent because of the repetition of the sequence *niwa*. However, with pitch accent, it is clear that the meaning of the sentence is ‘There are two roosters in the yard’ (Niwa ‘yard’ niwa ‘particles’ niwa ‘two’ niwatori ‘roosters’ ga ‘particle’ iru ‘there are’). Without pitch accent, speech sounds monotonous and it is harder to recognize word boundaries, which results in making communication more difficult. Toda (2003) claims that incorrect pitch accent gives listeners the impression that the speaker has a foreign accent. Therefore, learning correct pitch accent will help learners sound natural and allow them to communicate more effectively.

Special moras. Just like English, Japanese words can be divided into syllables, but they can also be divided into a small unit called a mora, which has some different characteristics compared to syllables. Traditionally, a syllable is said to be divided into three additional sub-units, which are onset, nucleus, and coda. However, a mora is not divided further into sub-units, and each mora is supposed to have the same length of time; this is why a mora is called a timing unit (Tsujimura, 2013).

Most moras are also syllables (e.g. ka, sa, and ta), but there are moras that are non-syllabic: i.e. long vowel, the moraic obstruent, and the moraic nasal. Since these moras have a special status, they are called special moras. Toda (2003) claims that special moras are difficult to acquire regardless of the learner’s first language (L1) because Japanese time unit structure is different from many other languages in the world, such as English, German and Swedish that are stressed-time and syllable-timed

languages such as French, Italian, and Spanish. Toda states that the field of phonetics is known to have the most influence of the L1 so that is why the acquisition of the special mora is difficult among learners.

Just like pitch accent, special moras can also change the meaning of words, depending on whether the word contains a special mora or not, and that is why special moras are considered one of the aspects that affects intelligibility in Japanese. This is exhibited in the following examples: 1) obasan (middle-aged woman) vs. obaasan (old lady), 2) kite (please come) vs. kitte (please cut), and 3) tani (valley) vs. tani (academic credit). There is a long vowel in the first example, and this is something learners should be careful of since learners could offend a middle-aged woman by accidentally calling her an “old lady.” The second example involves the single vs. double consonant contrast, and the speaker could be giving two totally different requests based on how accurately they pronounce the word. Finally, in the last example, the word for “academic credit” contains the moraic /N/ while the word for “valley” does not.

As the examples above demonstrate, one mora can change the entire meaning of a word. That is why it is important for learners to create awareness of the special moras and to practice producing it in an early stage of Japanese language learning.

Although various kinds of visual aids have been tested to find out their effectiveness in acquiring accurate pitch accent and special mora production, not all of

them seem to be effective. For the case of pitch accents, pitch curve, prosody graph, hook marks and Praat program have been used to assist learners in detecting the falling point of pitch accent (Fukui, 2007; Hirano, 2011; Matsuzaki, 1995; Nakagawa, 2010; Nakamura, 2011). However, these require technical understanding of these visual aids, which may not help learners to focus solely on pronunciation. As for special moras, it becomes important for learners to notice the durational difference between words that contain special moras and words that do not, and wave forms (Motohashi-Saigo & Hardison, 2009; Ofuka, 1997; Okuno, 2013) have often been used to assist learners in noticing the durational differences. However, study has shown that using waveforms in teaching durational differences in special moras may not be helping learners to notice the difference because waveform does not always provide a distinct durational difference (Okuno, 2013). It also does not seem to help if learners are just shown the model's waveform and are told to make their utterance as close as possible to the waveform if they do not receive any instruction on how to do so. Therefore, it is difficult to assume that this guess-and-try process could lead to acquisition.

From previous studies, it can be said that there is a gap between the teachers' and students' opinion and beliefs on pronunciation teaching and learning. To overcome the issues that the teachers are facing (time constraints in the classroom, lack of experience in teaching pronunciation, and lack of systematic materials), the current study developed an online system for learners of Japanese where they could

practice Japanese pitch accent and special moras pronunciation while learning new vocabulary. The benefits of this system includes 1) It could be assigned as a homework assignment and hence does not use any class time, 2) Incorporates pronunciation training into vocabulary practice, and 3) Teachers do not have to worry about teaching pronunciation. This system can also provide learners more opportunities to have repetition practice on pronunciation, while using visual aid.

In this study, the effectiveness of online repetition practice on improving learners' Japanese pitch accent and special moras production accuracy will be investigated, as well as comparing the effectiveness of the three visual aid types/modalities. This research was designed to answer the following questions.

Research Question 1

Do learners of Japanese show improvement in producing both pitch accent and special moras accurately after receiving repetition practice through an online system?

Hypothesis 1

Learners of Japanese will show improvement in producing both pitch accent and special moras accurately after receiving repetition practice through an online system.

Research Question 2

Among the three different treatment groups, (1. video + visual aid, 2. visual aid only, 3. video only) which group shows the most improvement from pretest to posttest?

Hypothesis 2

The improvement will be in the following descending order; video + visual aid, visual aid only, and video only group.

METHODOLOGY

There were three experimental groups and one control group, and all four groups read a total of 30 words that were chosen as the stimulus words for the pre-posttests, and for the practice session for the experimental groups. The three treatment groups received an online listen-and-repeat practice in between the pre-posttest, while all three groups received different input when they practiced. The three experimental groups used a video-based oral training computer application called *Speak Everywhere* (Fukada, 2013) in the practice session, while the control group received no pronunciation practice related to Japanese pitch accent and special moras. There are two independent variables in this study, which are listen-and-repeat practice and the different input the experimental groups received (visual aid types), and the dependent variable is the participants' pitch accent and special mora production.

Participants

Participants in this study were those enrolled in a first-year Japanese course during the fall semester in 2015 at an University in the U.S. Midwest. In this course, students meet in class five times a week for 50 minutes each. Since this was done as a pilot study for a larger project, the data was collected from only 6 subjects who

volunteered to participate in this study. All participants are females with their L1 being either English or Chinese, and they were randomly assigned to four groups.

Table 1: L1 Information and Length of Japanese Learning for Each Group

Group	Participant	L1
Video + Visual aid group	A	English
	B	Chinese
Visual aid only group	C	English
	D	English
Video only group	E	English
Control group	F	Chinese

Materials

Stimulus Words

30 words that are introduced in the first-year Japanese course were used in this study, and these words were selected from the textbook that is being used in the course (*Nakama 1*: written by Hatasa, Hatasa, & Makino). Within the 30 words, all four pitch accent types (high head pattern, high middle pattern, flat pattern, and no accent) and all three special mora types (long vowel, double consonant, and the moraic nasal) were included. The order of these 30 words were randomized for both pretest and posttest.

Online vocabulary practice

The online oral practice software program called *Speak Everywhere* was used in the present experiment. This software was used to record learners' production

during pre-post tests, and was also used for the pronunciation practice for the three experimental groups.

The format of the pretest and the posttest was to say the word that appeared on the screen aloud and record their utterance (see Figure 1).

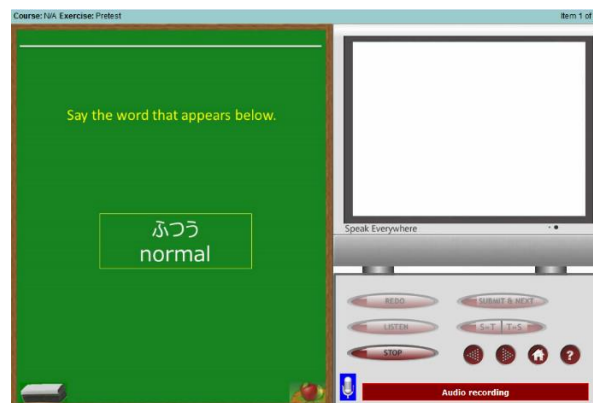


Figure 1: Pretest and Posttest Screen

For the Video + visual aid group, a video where a native speaker saying the word and a visual aid which modeled a “karaoke” system was shown at the same time. In this “karaoke” type visual aid, each mora in the word appears at the same time as when that mora is pronounced, and it also indicates the high the and low pitch as that mora is being pronounced (See Figure 2). It is important for learners to understand that the length of a special mora is approximately the same as any other mora, and that each mora has either a high or a low pitch accent and where the pitch falling point is located. Thus, a visual aid that explicitly shows this concept was developed for this study.



Figure 2: Video + visual aid Screen

For the visual aid only group, the participants were only shown the karaoke style visual aid while they were doing repetition practice (See Figure 3) and for the video only group, the karaoke model was not provided and only the video of the model saying the word was shown to the participant (See Figure 4).

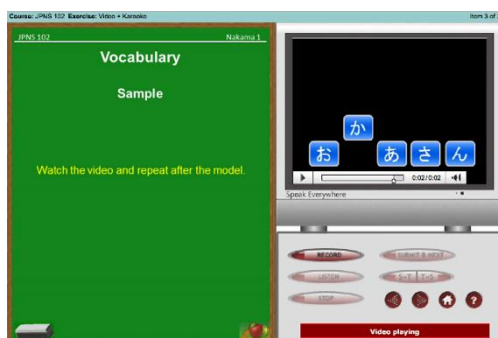


Figure 3: Visual aid only Group Screen



Figure 4: Video only group Screen

For the Video + visual aid group and the visual aid only group, a brief explanation video about the concept of the karaoke visual aid was provided before they started the repetition practice. After the treatment, all participants completed the posttest. The entire process did not take more than 30 minutes for each group.

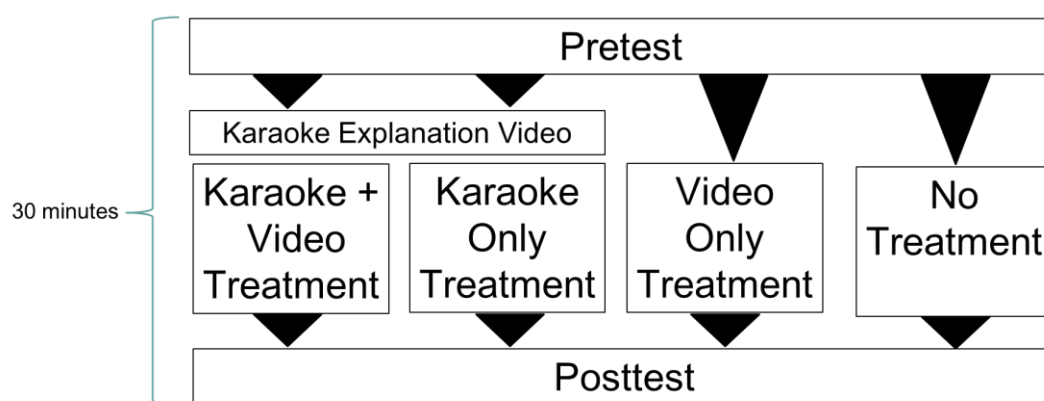


Figure 4: Overview of the Present Study

Measurement

For this present study, 30 words from pretest and posttest from 6 participants' recording were analyzed. Each words were listened by the present researchers of this study, and both of them first rated the accuracy of the pitch accent, and then the accuracy of the length of the moras. Each item was rated either correct (1 point) or incorrect (0 point). When there was a conflict between the two raters, the raters negotiated and came to a mutual agreement.

Data Analysis

Due to the number of participants, descriptive analysis was used to compare the gain score between pretest and posttest.

RESULT

Research Questions and Hypotheses

First, whether learners of Japanese show improvement in producing both pitch accent and special moras accurately after receiving repetition practice through an online system was examined.

The following is the result of the pitch accent. Table 2 shows the pitch accent score for all participants, and the scores they gained from pretest to posttest. The maximum score for each test is 30.

Table 2: Result of the improvement in pitch accent

Group	Participant	Pretest Score	Posttest Score	Gain
Video + Visual Aid	A	6	12	6
	B	19	25	6
Visual Aid Only	C	13	16	3
	D	10	13	3
Video Only	E	8	10	2
Control Group	F	16	15	-1

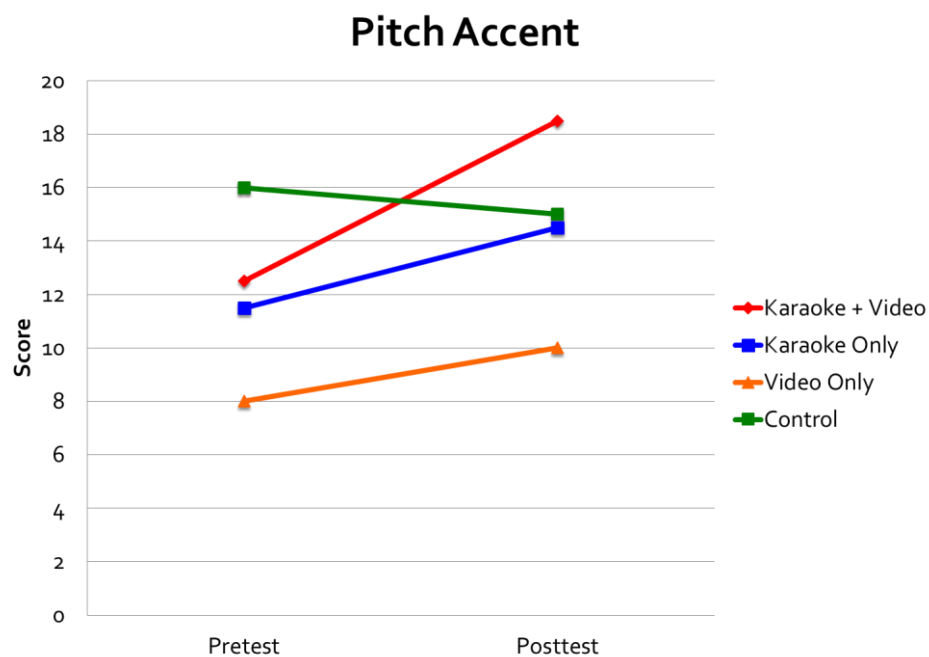


Figure 5: Result of the improvement in pitch accent from pretest to posttest

At the level of descriptive statistics, the participants in all three experimental groups improved their pitch accent score after they did repetition practice, while the participant in the control group actually had a decrease in her score. Therefore, Hypothesis 1 “Learners of Japanese will show improvement in producing both pitch accent and special moras accurately after receiving repetition practice through an online system” was confirmed for the case of pitch accent.

Next the result of the special moras will be discussed. Table 3 shows the mora accuracy score for all participants, and the scores they gained from pretest to posttest. The maximum score for each test is also 30.

Table 3: Result of the improvement in special mora

Group	Participant	Pretest Score	Posttest Score	Gain
Video + Visual Aid	A	24	22	-2
	B	22	22	0
Visual Aid Only	C	22	23	1
	D	20	24	4
Video Only	E	24	23	-1
Control Group	F	22	25	3

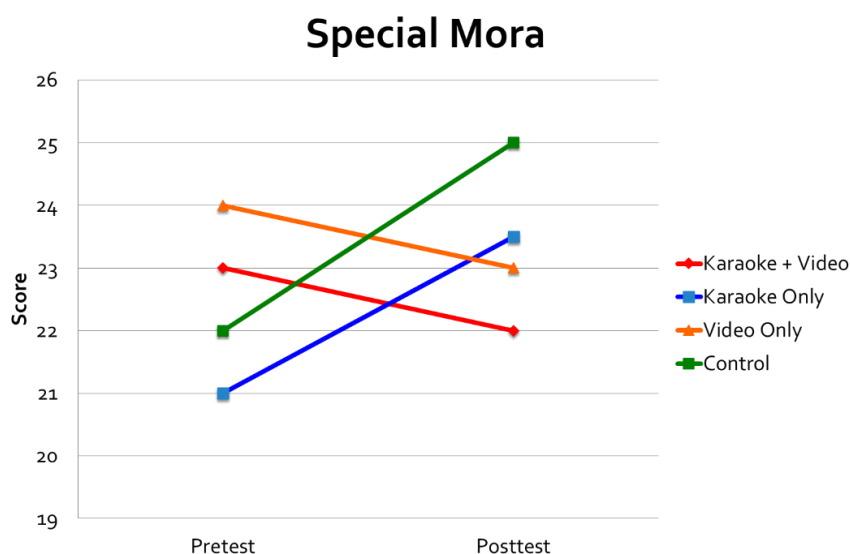


Figure 6: Result of the improvement in mora accuracy from pretest to posttest

While repetition practice was found to be effective for pitch accent at the level of descriptive statistics, the same result was not found for special moras. There were some participants from the experimental group that showed improvement from pretest to posttest, as well as some that actually performed worse in the posttest, and the participant in the control group whom did not receive any repetition practice actually showed improvement from pretest to posttest. Therefore, hypothesis 1 was not confirmed for the case of special mora.

The result of the pitch accent will only be examined to answer research question 2, “Among the three different treatment groups, (1. video + visual aid, 2. visual aid only, 3. video only) which group shows the most improvement from pretest to posttest?” since hypothesis 1 was not confirmed for special moras.

At the level of descriptive statistics, the participants in all three experimental groups improved their pitch accent score after they did repetition practice, as it was

confirmed in hypothesis 1. The group that showed most improvement was the video + visual aid group, which both participants improved by 6 points, and the group that showed the second most improvement was the visual aid only group which both participants improved by 3 points. Finally, the participant in the video only group improved by 2 points (see Table 2 and Figure 5). Therefore, hypothesis 2 was confirmed for the case of pitch accent, as the result came out in the hypothesized order.

DISCUSSION

Summary of the Findings and Discussions

Hypothesis 1 was examined to answer research question 1, “Do learners of Japanese show improvement in producing both pitch accent and special moras accurately after receiving repetition practice through an online system?” In hypothesis 1, it was postulated that the participants in the experimental groups will show improvement in producing both pitch accent and special moras accurately after receiving repetition practice, but an improvement in the pitch accent was only observed. In research question 2, it was examined which treatment group shows the most improvement from pretest to posttest, and similarly to research question 1, hypothesis 2 was confirmed only for the case for pitch accent. There could be multiple reasons to why only the pitch accent showed the result that was hypothesized.

As discussed earlier, two of the participants did show improvement in

producing special moras after receiving repetition practice, but these participants were not from one particular treatment group. It is questionable why some participants in the experimental group did even worse in the posttest compared to the pretest, but this could be due to the fact that participants paid closer attention to the pitch accent more than the special moras. Since this study was conducted as a pilot study for a larger project, an interview session followed the experimental session to receive feedback from the participants who used the karaoke system visual aid (participants in the video + visual aid group and visual aid only group). When the present researchers asked what they thought about the visual aid, all of the participants answered they liked it, because they were able to visualize the pitch accent. However, there were no mention about the special moras in their responses. Therefore, it seems like the concept of pitch accent that was assisted through the visual aid was easier for the participants to grasp, and paid more attention to it than the concept of the moras. Although no explicit instruction about pitch accent or special mora is usually given in the classroom, learners can see whether the word contains a special mora or not by the orthography, but pitch accent is not part of the Japanese orthography, hence, learners simply have to memorize the pattern for each word. Therefore, it could have been that since learners usually do not see the pitch accent for each words explicitly, they paid more attention to it.

Also, as we can see from Table 2 and 3, the scores from the pretest on the moras were much higher than the pitch accent scores. This can also indicate that there

was more improvement to make for the pitch accent than the special moras, and that learners became aware of the difference from their own production comparing it to the model's for the pitch accent, which resulted in overall more improvement.

CONCLUSION

Limitations of the Present Study and Future Possibilities

The present preliminary research was designed to investigate whether learners' pitch accent and special mora production improve (in terms of accuracy) after receiving listen-and-repeat online practice, and if it does, which input leads to the most improvement in pitch accent and special moras production. For the listen-and-repeat practice, three input types were used which were video + visual aid (modeling a "karaoke" system), visual aid ("karaoke" system) only, and video only. The findings from this study showed that online repetition practice has a short-term positive effect on pitch accent production, and that the video + visual aid input leads to most improvement. On the other hand, the same result was not observed for the case of special moras. Although this study revealed an interesting finding, since it was a preliminary study, there are several limitations. One is the rating and another is the length of experiment. It is better to have non-researcher raters and have a longer-term experiment.

Final Remark

This study showed that repetition practice is beneficial in short-term production of accurate pitch accent, although this type of practice is often times

avoided among language instructors. However, instructors who are hesitant in incorporating repetition practice in class do not necessarily have to, because this type of practice could be easily done outside of the classroom using CALL programs such as *Speak Everywhere*, while using an effective visual aid which could enhance their learning process. While much research must be done on the acquisition of Japanese pronunciation, especially on pitch accent and special moras, and that future research should be expanded on the aspects that was limited in this study, it is hoped that the results obtained from this study will encourage instructors to incorporate pronunciation practice into language curricula.

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